DOCUMENT RESUME

ED 351 503 CE 062 271

AUTHOR Owens, James R.
TITLE Principles of Technology: University Infusion. Vocational Education Research.
INSTITUTION Southeastern Louisiana Univ., Hammond.
SPONS AGENCY Louisiana State Dept. of Education, Baton Rouge. Div. of Vocational Education.
PUB DATE 15 Dec 89
NOTE 51p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS College Credits; *College Programs; Core Curriculum; Course Content; *Course Descriptions; *Credit Courses; *Curriculum Development; *Educational Improvement; Educational Planning; Higher Education; Statewide Planning; Teacher Education; *Technical Education; Technology
IDENTIFIERS *Principles of Technology

ABSTRACT

A study sought to determine the extent and scope of courses in principles of technology being taught on the university level in the United States, especially in preservice teacher education programs. Data were gathered through mailed questionnaires, with 144 universities (59 percent of those queried) replying. Some of the findings of the survey are the following: (1) half the universities stated that an introductory technology course was required of undergraduate students for a degree; (2) the course title varied greatly among respondents, with "Technology and Society" and "Principles of Technology" cited most frequently (23 percent); (3) the colleges in which the courses were taught were technology and education; (4) more than half the universities responding said that the course was 3 hours of lecture, and some included a 2-4 hour laboratory; (5) 71 percent of the universities had no prerequisites for the course; and (6) most courses enrolled 21-30 students. Based on analysis of the survey responses, recommendations were made to incorporate a "Principles of Technology" course into the Southeastern Louisiana University degree program for at least 3 hours in freshman year. It was also proposed that the International Technology Education Association design a model curriculum for such a course. (Appendixes to the report include the survey questionnaire and letters of transmittal.) (KC)

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PRINCIPLES OF TECHNOLOGY:
UNIVERSITY INFUSION

JAMES R. OWENS, Ph.D.

Funded by
The State of Louisiana
Department of Education
Office of Vocational Education

Southeastern Louisiana University
Hammond, Louisiana
December 15, 1989

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FOREWORD

This Research Guide, Principles of Technology: University Infusion, was produced as a result of a project funded by the Louisiana Department of Education to Southeastern Louisiana University. This Model Unit represents the concerted efforts of Industrial Arts/Technology Education teachers throughout the United States. This Unit has been field tested and evaluated.

We believe that this Guide will make a major contribution to the improvement of instruction in Technology Education in Louisiana.

Wilmer S. Cody
State Superintendent of Education

ACKNOWLEDGEMENTS

This publication represents the cooperative efforts of personnel in the Industrial Technology Department, Southeastern Louisiana University, and the Industrial Arts/Technology Education Section in the Office of Vocational Education, Louisiana Department of Education. Special recognition goes to Dr. James R. Owens who served as Project Director and to university faculty members who served as Project Research Specialists in the development of the guide. Another highly significant contributor to this project was the final report editor, Dr. Florent Hardy, Jr. Also, a special commendation goes to Mr. W. Jerry O'Shee who worked so diligently to make the publication a reality.

Don R Wood

Don Wood
Assistant Superintendent
VOCATIONAL EDUCATION

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CHAPTER I

INTRODUCTION

Universities are requesting funds for an innovative preservice course in applied science that will enable future teachers to better prepare today's students for tomorrow's careers in high technology. This course is called Principles of Technology and is offered through secondary Industrial Arts/Technology Education Programs to eleventh and twelfth grade students. This course is to be initiated by Southeastern Louisiana University (SLU) into the Industrial Arts/Technology Education Teacher Training Program in the 1989-90 school year.

The purpose of the course is to strengthen academic foundations of vocational education through teaching strategies designed to teach the fundamental principles of mathematics and science through practical applications which are an integral part of the student's occupational exploration. This course will utilize the "Principles of Technology" curriculum and will become an integral

part of the Industrial Arts/Technology Education Teacher Training Program.

These universities will use Carl Perkins Funds for the acquisition of equipment, supplies, and instructional demonstration materials necessary to expand the Industrial Arts/Technology Education Teacher Training Program with the inclusion of the course called "Principles of Technology".

Statement of the Problem

"Principles of Technology" is based on the Unified Technical Concepts (UTC) curriculum developed by the Center of Occupational Research and Development (CORD) of Waco, Texas. Unified Technical Concepts is post-secondary instruction in applied physics taught at community colleges, technical schools, and as a part of many industry training programs.

An implementation handbook for "Principles of Technology" contains extensive information on how, why, where, and to whom this new course should be taught. Specific information is presented for teachers and counselors regarding equipment, supplies, implementation, timelines, and dissemination. However, all

information and support data are designed soley for the secondary level of instruction, only.

Thus, the statement of the problem is: **How will "Principles of Technology" be taught at the university level as a component of a teacher training program?**

The purpose of this proposed project was to research how the different states in our country (i.e., South Carolina, Oklahoma, etc.) have implemented "Principles of Technology" on the university level. The nature of the problem indicates that the descriptive method of research using the mailed questionnaire should be utilized.

Objectives

To determine the degree and level of involvement of states and universities in "Principles of Technology" preservice education.

To establish the common criteria and support data regarding course implementation at the university level.

To develop a process model with specific timelines for adoption/adaptation of "Principles of Technology" by teacher training programs.

To disseminate all research findings with recommendations to all regional and state universities

and the Louisiana Department of Education.

Description of the Nature of the Problem

The field of Industrial Arts/Technology Education is currently being subjected to a serious reappraisal in response to the problems created by our rapidly changing society. Some Industrial Arts/Technology Education programs operate with very little planning. Many programs are centered around the expertise of the teacher. As a result of this, the curriculum is often based upon what the teacher knows and not upon what the student needs.

Nationally, a number of innovative programs were implemented at the junior high level to help alleviate this problematic situation. Many of these programs were associated with an examination of the structure of industry and the technological society in which we live and work. Efforts were also made to implement Industrial Arts/Technology Education into the total concept of career education. This challenge was attempted through the Industrial Arts Curriculum Project (I.A.C.P.) in 1965. The project launched a massive research and development effort that included not only a staff of Industrial Arts/Technology Education educators, but also

logicians, historians, philosophers, economists, sociologists and specialists from all phases of industry.

In November, 1973, Industrial Arts/Technology Education was added to Public Law 92-318, the Vocational Education Act, thereby allowing such activities as research and development, curriculum development and the establishment of student clubs to receive direct program support. Then, as is now, the policies regarding the administration of vocational education are established and the state plan is adopted by the State Board of Elementary and Secondary Education (BESE) which serves as Louisiana's State Board of Vocational Education. The state plan must include curriculum requirements which, in turn, must be met by Industrial Arts/Technology Education courses and/or programs in order to be eligible to receive funds under the Vocational Education Act and its amendments.

Following the era of career education, Industrial Arts/Technology Education was redirected through vocational funding. Other intervening forces have been accountability and the "back to basics" movement. In the late 1950's, Industrial Technology was incorporated into many of the Industrial Arts/Technology Education programs

at the university level. Some programs changed the names of a few courses, but did little to revise curriculum or personnel requirements. A combined effort to address Technology Education at the university level was provided through a recent industrial technology curriculum analysis, an external accreditation review, and efforts to incorporate Principles of Technology into the curriculum.

Normal procedure in Louisiana dictates that before universities implement new courses, catalog changes must be proposed and approved. Department, college and university curriculum committees must meet, review, and approve all changes. The following documentation must accompany a new course request:

A. Proposed catalog description (department, number, credits, prerequisites, etc.)
B. Contact hours: Lecture __ Laboratory __
C. Frequency of offering
D. Justification for offering
E. Justification for course level
F. Justification for prerequisite
G. Estimated enrollment for next three years
H. Degree for which course is required

I. A bried description of any existing required course being replaced by the new course

J. Outline of new course to include the following: General course description, course objectives, course outline, texts and/or bibliography, and methods of evaluation

K. Impact of new course on present resources: Additional staff needed, special fee assessment, additional space, equipment, or special library materials needed

L. The anticipated impact on other programs within the department, college, and university-wide

Therefore, an applied research study addressing the aforementioned data/criteria for course implementation was conducted.

Education Significance

As a result of an accreditation review and recommendations concerning the Industrial Technology curriculum at SLU, the Teacher Education courses and curriculum were revised. All changes were approved by the College of Education and College of Science and Technology Curriculum Committees, the University Curriculum Committee, and the Louisiana Board of Regents.

The curriculum changes were implemented during the 1987-88 academic year. The new courses and curriculum were supported by the Louisiana Department of Education. The Department of Industrial Technology faculty supported approval by the State Board of Elementary and Secondary Education for Industrial Arts/Technology Education teachers to teach "Principles of Technology" in Louisiana schools. High school students can now receive a science or Industrial Arts/Technology Education credit toward graduation. It should also be mentioned that as of August, 1987, the new name of our teacher professional organization is the "Louisiana Industrial Arts/Technology Education Association" (LIA/TEA).

To comply with emerging trends and developments within the areas of Industrial Technology and Technology Education, data concerning implementing the Principles of Technology course at the university level is needed. This course is currently recommended by the Center for Occupational Research and Development, the International Technology Education Association, and the Louisiana Department of Education.

All of the support data regarding course implementation is geared for the local school level. The

universities must become involved through preservice courses and inservice workshops. Therefore the goal of this research project is to provide specific recommendations for the implementation of the Principles of Technology course at the university level based upon results which have been proven successful in universities throughout the United States.

CHAPTER II

PROCEDURE

The purposes of this chapter are to describe the methods used in developing the survey instrument and to explain the procedure used in conducting the survey. The information is discussed in the following sequence:

1. Development of the instrument
2. Testing of the instrument
3. Selection of the study population
4. Collection of the data
5. Analysis of the data

Development of the Instrument

Related studies, state and national curricular networks, periodicals, professional organizations, and books on research were reviewed to ascertain the most appropriate type of instrument to use in the study. This search of the related literature revealed that no standardized tests nor instrument exists. It was decided by the investigator that it would be best to construct an instrument sensitive to the population being surveyed.

The mailed questionnaire was chosen because of greater contact possibilities and its relative low cost when compared with other methods of study. However, the

questionnaire is not a quick and easy melthod of investigation, but it is a primary method for data gathering in descriptive survey studies and can gather and secure data from widely scattered sources. The questionnaire was designed to obtain maximum information while requiring minimal effort and time from the respondents. It was also constructed to include both checklists and free response or "open-end" questions. The checklists were included for ease of operation and to speed up recording of the data. Open-end questions were included in the instrument so that respondents had the opportunity to submit additional or supplemental information.

Testing the Instrument

Upon completion of the rough draft, the preparer requested faculty members to examine the questionnaire for accuracy, clarity, and nomenclature. Suggestions were given and revisions were made. The revised questionnaire was then field-tested by a jury of twelve professionals. Half of the jury was composed of teacher educators with varied experience and employment backgrounds. The remaining six jury members were employed in education with varied levels of teaching and

supervisory experience. Upon completion of the questionnaire, the members of the jury were asked for comments pertaining to their time consumed in completing the survey, its general appearance, the ease of operation, clarity, directions, interpretation and any suggestions for improvement. Following the tabulation results, revisions were made and the final draft was printed (Appendix A).

Selection of the Study Population

University addresses were obtained from the 1988-1989 edition of the Industrial Teacher Education Directory published by the Council on Technology Teacher Education and National Association of Industrial and Technical Teacher Educators. A letter stating the purpose of the study was sent to the editor requesting university addresses. As a result, names and addresses of 245 institutions were received. Self-adhesive mailing labels for each university with administrators' names and titles were also obtained.

Collection of the Data

Accompanying each questionnaire were both a letter of transmittal and a stamped, self-addressed return envelope. The letter of transmittal (see Appendix B)

briefly explained the importance of the study, the purpose of the study, and questions for which answers were sought. The letters were signed by the investigator and printed on university letterhead stationery. This was done to demonstrate to the universities that the study was supported by Southeastern. The letters also stated that each respondent would receive a summary of the research findings. A stamped, self-addressed return envelope plus additional questionnaires were included in the mailings because research has shown that the response rate is higher when this method is used. At the end of three weeks, 36 or 14.69 percent of the questionnaires had been returned. A follow-up mailing was then sent to the remaining nonrespondents. The follow-up increased the returnees to 78 or 31.84 percent. A third follow-up was conducted six weeks after the initial mailing. This final follow-up increased the total number of returned questionnaires to 144 or 58.78 percent.

Analysis of the Data

As the questionnaires were received, information was recorded according to its nature and type of response. Names and addresses of universities and contact representatives were recorded for future departmental

use. Data received from "open end" or free response questions were categorized and recorded. An analysis of means and percent of raw totals was utilized to interpret the data. The presentation of the data primarily involved frequencies and percentages. All data were tabled for graphic representation and included narrative summaries.

CHAPTER III

PRESENTATION AND INTERPRETATION OF DATA

The previous chapters were concerned with identification of the problem and procedures used to collect data for this study. The purpose of this chapter is to present statistical analysis and interpretation of the data collected. An explanation of data interpretation and results is presented as follows:

A total of 245 universities, external to the State of Louisiana, were surveyed with a total of 144 surveys, 58.78%, returned. Ninety-nine course titles were submitted by the universities responding.

TOTAL UNIVERSITIES SURVEYED - 245
TOTAL SURVEYS RETURNED - 144
TOTAL PERCENTAGE OF SURVEYS RETURNED - 58.78%
TOTAL NUMBER OF COURSE TITLES RECORDED - 99

In response to Question One, does your university offer an undergraduate course such as Principles of Technology, Technology Literacy, or Technology and Society, a positive response of "yes" was indicated by 50.00% of the universities responding.

	TOTAL RESPONSES	PERCENTAGES
YES RESPONSE	72	50.0%
NO RESPONSE	72	50.0%
TOTAL SURVEYS RECEIVED	144	100.0%

In response to Question Two, what is/are the course title(s), Technology and Society and Principles of Technology accounted for 23.24%, the majority of the total courses submitted. Introduction to Technology was the third highest of the course titles taught in the universities.

	COURSE TITLE	TOTAL RESPONSES	PERCENTAGES
1.	Technology and Society	12	12.13%
2.	Principles of Technology	11	11.11%
3.	Introduction to Technology	8	8.08%
4.	History of Technology	4	4.04%
5.	Modern Technology and Civilization	3	3.03%
6.	Technology and Man	3	3.03%
7.	Technology and Culture	3	3.03%
8.	Introduction to Industry	2	2.02%
9.	Technology Literacy	2	2.02%
10.	Technology Education	2	2.02%
11.	Introduction to Technical Education	2	2.02%
12.	Technology, Industry, and Change	2	2.02%
13.	Evolution of Technology	2	2.02%
14.	Principles of Technology for BSED & BST	1	1.01%
15.	Technological Literacy for BST (only)	1	1.01%
16.	Survey of Technology	1	1.01%
17.	Introduction to Manufacturing Technology	1	1.01%
18.	Technology Awareness	1	1.01%
19.	Technical World and Man	1	1.01%
20.	Implementing Principles of Technology	1	1.01%

21.	Industrial Technology Laboratory I	1	1.01%
22.	Modern Industry	1	1.01%
23.	Emerging Technologies	1	1.01%
24.	Technology Application	1	1.01%
25.	Teaching Principles of Technology	1	1.01%
26.	Practicism in Industrial Arts	1	1.01%
27.	Technology: International Social and Human Problems	1	1.01%
28.	Applied Physics	1	1.01%
29.	Technology, Science and People	1	1.01%
30.	Technology Systems	1	1.01%
31.	Basic Technology Concepts	1	1.01%
32.	Industry and Society	1	1.01%
33.	Perspectives in Technology	1	1.01%
34.	History/Philosophy of Industrial Education	1	1.01%
35.	Energy and Society	1	1.01%
36.	Introduction to Communication Technology	1	1.01%
37.	Science and Society	1	1.01%
38.	Technology Overview	1	1.01%
39.	Elements of Technology Education	1	1.01%
40.	Education and Technology: A Philosophical Approach	1	1.01%
41.	Design and Technology	1	1.01%
42.	Technology and Its Impact on Humans	1	1.01%
43.	Technological Impact	1	1.01%
44.	Introduction to Technology and Vocational Education	1	1.01%
45.	Introduction to Interdisciplinary Technology	1	1.01%
46.	Multidisciplinary Seminar in Technology	1	1.01%
47.	Contemporary Issues in Technology	1	1.01%
48.	Technology Assessment	1	1.01%
49.	Technology Organization	1	1.01%
50.	Principles of Managing Technological Change	1	1.01%
51.	Technology and Public Policy	1	1.01%
52.	TED 280: Technology, Society, and Education	1	1.01%
53.	Environment, Technology, and Society	1	1.01%
54.	Science and Technology in the Modern World	1	1.01%
55.	Man, Technology, and Society	1	1.01%
56.	Introduction to Industrial Technology, IT 172	1	1.01%
	TOTAL	99	100.00%

Eighty-seven of the 99 courses (87.88%) had the word "Technology" or "Technological" in their titles, while fourteen course titles contained "Principles of Technology." Eighteen courses contained "Society" in their titles, while only three contained "Literacy."

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Question Three asked in which department and college is/are the courses taught? "Industrial Technology" and "Technology" accounted for 28.29%, or the majority of the departments in which the courses submitted are taught.

	COURSE TITLE	TOTAL RESPONSES	PERCENTAGES
1.	Industrial Technology	16	16.17%
2.	Technology	12	12.12%
3.	Interdisciplinary Technology	9	9.09%
4.	Industrial Education Technology	7	7.07%
5.	Industrial Studies	7	7.07%
6.	Technology Education	6	6.06%
7.	Industrial Education	5	5.05%
8.	Vocational Technology Education	4	4.04%
9.	Industrial Sciences	3	3.03%
10.	Science	3	3.03%
11.	Manual Arts	2	2.02%
12.	Curriculum and Instruction	2	2.02%
13.	Manufacturing	2	2.02%
14.	History	2	2.02%
15.	Curriculum Studies	1	1.01%
16.	Industry	1	1.01%
17.	Industry and Technology	1	1.01%
18.	Agriculture	1	1.01%
19.	Science and Technology	1	1.01%
20.	Technology and Social Change	1	1.01%
21.	Sociology, Labor and Industrial Relations	1	1.01%
22.	Engineering Technology	1	1.01%
23.	Educational Foundation	1	1.01%
24.	Adult, Career, and Technology Education	1	1.01%
25.	Manufacturing and Construction Management	1	1.01%
26.	Engineering	1	1.01%
27.	Physics	1	1.01%
28.	General Education	1	1.01%
29.	No Response	5	5.05%
	TOTAL	99	100.00%

However, Education was included in 25 of the 99 various department names. Technology and Education accounted for 43.44%, or the majority of the colleges, with 32 of the 99 colleges (32.32%) involving science.

COLLEGE	TOTAL RESPONSES	PERCENTAGES
1. Technology	23	23.24%
2. Education	20	20.20%
3. Science and Technology	6	6.06%
4. Arts and Science	4	4.04%
5. Applied Science and Technology	4	4.04%
6. Science	3	3.03%
7. Fine and Applied Arts and Sciences	3	3.03%
8. Professional Studies	3	3.03%
9. Applied Human Science	3	3.03%
10. Basic and Applied Science	3	3.03%
11. Human Resources Development	2	2.02%
12. Natural Sciences	2	2.02%
13. Business	2	2.02%
14. Science and Humanities	2	2.02%
15. Engineering Education	1	1.01%
16. Industry and Technology	1	1.01%
17. Career and Vocational Education	1	1.01%
18. Education and Psychology	1	1.01%
19. Fine and Applied Arts	1	1.01%
20. Business, Industry, and Communications	1	1.01%
21. Liberal Arts	1	1.01%
22. Natural and Applied Science	1	1.01%
23. Business, Communication, and Technology	1	1.01%
24. Mathematical Sciences and Technology	1	1.01%
25. Fine and Professional Arts	1	1.01%
26. No Response	8	8.08%
TOTAL	99	100.00%

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Question Four concerned the number of credits per course; semester or quarter system. A majority of the courses (77%) accounted for 3 credits.

Possible # of Credits	5	4	3	2	1	TOTAL
Total # of Responses	4	10	76	8	1	99
Percentages	4%	10%	77%	8%	1%	100%

A majority, 84.85%, of the courses are taught on the semester system.

	Semester System	Quarter System	TOTAL
Total # of Responses	84	15	99
Percentages	84.85%	15.15%	100%

In response to Question Five, Contact Hours: Lecture and Laboratory, the majority of the courses, 54.55%, contained three hours of lecture.

LECTURE HOURS

Pos. Hrs.	1	1.5	2	2.5	3	4	16	20	25	30	32	40	48	50	60	No Resp.	TOTAL
Resp.	5	1	22	1	54	3	1	2	2	1	1	2	1	1	1	1	99
%	5.05	1.01	22.22	1.01	54.55	3.03	1.01	2.02	2.02	1.01	1.01	2.02	1.01	1.01	1.01	1.01	100.0%

If the course included a laboratory, it was most likely to be from two to four hours.

LABORATORY HOURS

Pos. Hrs.	0	1	1.5	2	3	4	6	10	12	30	32	40	50	60	75	TOTAL
Resp	61	6	1	8	5	7	2	1	1	1	1	1	1	1	2	99
%	61.62	6.06	1.01	8.08	5.05	7.07	2.02	1.01	1.01	1.01	1.01	1.01	1.10	1.01	2.02	100.0%

In reply to Question Six, Frequency of Offering, 48.49% of the courses are offered once every semester or quarter, and 44.44% are offered once every semester or quarter.

	TOTAL RESPONSES	PERCENTAGES
ONCE EVERY SEMESTER OR QUARTER	48	48.49%
ONCE EVERY SCHOOL YEAR	44	44.44%
OTHER: (PLEASE SPECIFY)		
NEW COURSE	1	1.01%
SUMMER ONLY	3	3.03%
FALL ONLY	2	2.02%
10 SECTIONS PER SEMESTER	1	1.01%
TOTAL	99	100.00%

The data from Question Seven, Course Level, indicated that the majority of the courses are taught on a freshman level.

POSSIBILITIES	TOTAL RESPONSES	PERCENTAGES
Freshman	22	22.23%
Freshman/Sophomore	15	15.15%
Freshman/Sophomore/Junior	1	1.01%
Sophomore	9	9.09%
Sophomore/Junior	3	3.03%
Sophomore/Junior/Senior	2	2.02%
Junior	15	15.15%
Junior/Senior	9	9.09%
Senior	12	12.12%
Graduate	10	10.10%
Undergraduate	1	1.01%
TOTAL	99	100.00%

The remaining courses are taught to upperclassmen with 10.10% taught to graduate students only.

Question Eight, Prerequisites, found that the majority of the courses submitted required no prerequisite.

		TOTAL RESP.	PERCENTAGES
1.	Required no prerequisite.	70	70.71%
2.	Bachelor's degree, 2.75 GPA, and two letters of recommendation.	8	8.08%
3.	At least a Junior.	2	2.02%
4.	Basic Students Chemistry or Physics Lab.	1	1.01%
5.	Non-Majors Only.	1	1.01%
6.	Material and Process Course and admission to Teacher Education.	1	1.01%
7.	Sociology 100.	1	1.01%
8.	Algebra.	1	1.01%
9.	Math 106 and two (2) course sequence in science.	1	1.01%
10.	Introduction to High Technology and Energy I.	1	1.01%
11.	Physics (college), Inservice Algebra, and senior status.	1	1.01%
12.	High school Advanced Algebra.	1	1.01%
13.	Physics 151/152, Metals 300/301, Calculus I, and Chemistry 151.	1	1.01%
14.	Teacher Certificate in Industrial Technology Education or Physics, General Science, and be employed as a teacher.	1	1.01%
15.	Principles of Technology during the following year.	1	1.01%
16.	College Algebra.	1	1.01%
17.	Junior standing and lower level Social Studies prerequisite.	1	1.01%
18.	Seventeen (17) Program.	1	1.01%
19.	Previous technological work experience.	1	1.01%
20.	Graduate standing.	1	1.01%
21.	Course from General Education list and Junior standing.	1	1.01%
22.	The Course Evolution of Technology.	1	1.01%
	TOTAL	99	100.00%

However, 8.08% required a prerequisite of a bachelor's degree, 2.75 GPA, and two letters of recommendation.

Question Nine, Estimated Enrollment, varied in response from 4 students to 200 students. For the majority of the courses an estimated enrollment of 21-30 students was listed.

ESTIMATED ENROLLMENT	TOTAL RESPONSES	PERCENTAGES
4 - 12 students	15	15.15%
15 - 20 students	9	9.09%
21 - 30 students	31	31.32%
31 - 40 students	12	12.12%
50 - 75 students	10	10.10%
50 - 100 students	5	5.05%
80 - 100 students	12	12.12%
101 - 150 students	2	2.02%
125 - 200 students	2	2.02%
No Response	1	1.01%
TOTAL	99	100.00%

However, 15.15% of the courses had a much lower estimated enrollment of 4-12 students.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The changes taking place in the field of Industrial Arts/Technology Education reflect the changes taking place in our society today: The World is becoming much more technologically complex, and to succeed in it, our students today must be better prepared for it.

Trends in education both within Louisiana and across the country indicate that a "Principles of Technology" course should be instituted within all bachelor's degree programs. In order to accomplish this, some investigation was made. Preliminary data indicated that within the State of Louisiana, no collegiate level course of this type was required. However, such a course was offered by many schools at the secondary level.

SUMMARY

The main purpose of this study was to gather information from other universities across the United States concerning their requirement of such a course in their four-year degree programs, and if so, general descriptive information concerning the course and its institution was sought. The goal of the project was to define what is currently being done across the United States regarding this question of technology literacy of

students. To more clearly define this goal and purpose of the study, the following major objectives were established:

1) To determine the degree and level of involvement of states and universities in "Principles of Technology" preservice education.
2) To establish the common criteria and support data regarding course implementation at the university level.
3) To develop a process model with specific timelines for adoption/adaptation of "Principles of Technology" by teacher training programs.
4) To disseminate all research findings with recommendations to all regional and state universities, and to the Louisiana Department of Education.

The descriptive method of research using the mailed questionnaire was utilized in this study. Information was obtained from 144 universities (58.78% surveys returned).

Data were recorded according to their nature and type of response. Names and addresses of universities

and contact representatives were recorded. Data received from "open end" questions were categorized and recorded. Descriptive analysis, numbers, percentages, mean ratings, graphic representations and narrative summaries were made of the data. Findings of the study are concluded in the following paragraphs.

CONCLUSIONS

Of the 144 universities responding to the survey, 74 (50%) stated that an introductory technology course was required of undergraduate students to successfully complete graduation requirements.

The course title varied greatly among respondents, with two, Technology and Society and Principles of Technology, cited most frequently (23.24%). The departments most likely to be responsible for teaching this course were Industrial Technology or Technology (28.29%). Similarly, the colleges in which the courses were taught were Technology and Education (43.44%).

Respondents were most likely to offer the course as 3 credits on the semester system.

Most (54.55%) universities responding to this survey stated that the course was made up of three hours of lecture. If the course included a laboratory, it was from two to four hours.

When responding to the frequency in which the course was offered, little difference arose. That is, 48.49 percent of the respondents offered the course every semester or quarter, and 44.44 percent of the respondents offered the course once every school year. However, more than a third of the universities offered the course at the Freshman and Sophomore levels (37.38%). In contrast, very few (12.12%) limited the class to the senior level only.

Concerning prerequisites, 70.71 percent of the respondents had none.

Finally, when estimating enrollment, 31.32 percent of the respondents expected between 21 and 30 students to enroll in the course.

RECOMMENDATIONS

Based on the analysis of the responses to the survey questionnaire and the findings and conclusions of this study, the following recommendations are presented:

1. Incorporating a "Principles of Technology" course into the SLU degree program is an important and timely step. Data from this survey suggest that not only will it better prepare students in meeting the challenges which lay ahead of them, but they will be

at least if not slightly better prepared academically than their counterparts across the country. Since SLU's goal has been to provide a quality and well-rounded educational experience for its students, adopting a bachelor's degree program which includes an introductory technology course follows this philosophy quite well.

2. Although course titles varied, it is the opinion of the investigator that "Principles of Technology" best describes this class; it is a broad overview of Technology, as well as the Principles of this discipline.
3. It is worth noting that the department most likely to offer this course was the Department of Industrial Technology.
4. In addition, the course was most likely to be offered as a 3-credit lecture class (in a semester system). The opinion of the investigator is that to cover the variety and breadth of material in an adequate manner, nothing less than three credits should be required. And, as students

commonly take introductory-type courses in their freshman year, this course should be made available to those entering SLU.

5. In investigating the current status of teaching technology to college level students, the investigator was quite dismayed at the seemingly lack of attention paid to this critical area. The fact that there is no apparent model for teaching Introduction to Technology at the baccalaureate level is astounding. The author strongly urges the professional association, International Technology Education Association (ITEA), to design such a model and work for its adoption or adaptation in universities across this country. In addition, ITEA should market such a concept to the U. S. Department of Education, as well as urge accreditation boards to look for its presence in schools when up for review. Doing so will provide the country and ITEA mutual benefits: ITEA will continue at the forefront of technology education, gaining a stronger

voice, and be sought after for its leadership role in Technology Education matters. The country, as a whole, will produce educated people who will be technologically literate, prepared to meet many of the challenges presented to them by our society and world. Politically and economically, technology education can play an important part in keeping our nation safe and strong. It is up to us, as educators, to determine the most appropriate and effective means to teach this material. Time is of the essence.

APPENDIX A

SURVEY QUESTIONNAIRE

TECHNOLOGY EDUCATION ASSESSMENT

DEPARTMENT OF INDUSTRIAL TECHNOLOGY
SOUTHEASTERN LOUISIANA UNIVERSITY
P. O. BOX 847 - SLU
HAMMOND, LA 70402-0847

***University name and contact is optional. All respondents are guaranteed anonymity in reporting data. Return of completed questionnaire constitutes consent.**

College or University Name: _____

Person Completing this Survey Form

Name: _____ Title: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: ( ) _____ - _____

1. Does your university offer an undergraduate course such as Principles of Technology, Technology Literacy, or Technology and Society? (If no, **please return** this questionnaire **now**. If yes, please proceed.) ___ Yes ___ No
2. What is/are the course title(s)? _____

   _____
3. In which department and college is/are the course(s) taught?

   Department of _____ College/School of _____
4. Number of Credits: _____. Semester System _____ **or** Quarter System _____
5. Contact Hours: Lecture _____ Laboratory _____
6. Frequency of Offering: _____ once every semester or quarter
   _____ once every school year
   _____ every other school year
   _____ every third school year
   _____ other (please specify _____)
7. Course Level: ___ freshman ___ sophomore ___ junior ___ senior
8. Prerequisites: _____

   _____
9. Estimated Enrollment: _____

(OVER)

10. Please give the course description as it appears in your current undergraduate catalog. _____

11. **Course objectives, course outline, texts and/or bibliography references, and methods of evaluation** (which may be attached):

12. Resource impact including **staffing, special fee assessment, space requirements, equipment, or special library materials:** _____

THANK YOU FOR YOUR ASSISTANCE AND ANY ADDITIONAL INFORMATION!

APPENDIX B

LETTERS OF TRANSMITTAL

Southeastern Louisiana University | Department of Industrial Technology | P.O. Box 847, SLU Hammond, LA 70402 | 504-549-2189

July 11, 1989

Dear Technology Educator:

PLEASE HELP! I am conducting a survey that involves a national assessment of "Technology Education" implementation at the college or university level. I am doing this for two reasons. First, because I was recently appointed to a task force at Southeastern Louisiana University to study and make recommendations concerning a core curriculum for our new College of Arts and Sciences, of which the Department of Industrial Technology is a component. In fact, the President of our institution, Dr. G. Warren Smith, stated in our first meeting that he would like to see a curriculum that "addresses technology literacy because that is what will be needed for individuals to function in the 21st Century."

Many universities offer an innovative preservice course in applied science that prepares future teachers to teach today's students about new technology. Some universities utilize the "Principles of Technology" curriculum and have made it an integral part of the Industrial Arts/Technology Education Teacher-Training Program. Principles of Technology is based on the Unified Technical Concepts (UTC) curriculum developed by the Center for Occupational Research and Development (CORD).

Specific information is available for teachers and counselors regarding equipment, supplies, implementation, timelines, and dissemination. However, a majority of the support data is for the secondary level of instruction. Therefore, the second reason for this research is to assess how "Principles of Technology" is being taught at the college or university level as a component of a teacher training program.

The results of this survey will be reported in statistical terms. For your efforts in this study, you will receive a summary of the research findings. To aid in returning this form, I have enclosed a pre-addressed, stamped envelope. Thank you for your assistance.

Sincerely,

James R Owens

Dr. James R. Owens, Head

JRO:bjl

Enclosures

Southeastern
Louisiana
University

Department of
Industrial Technology

P.O. Box 647, SLU
Hammond, LA 70402

504-549-2189

January 26, 1989

Dr. R. Brad Lawson, Assistant Dean
School of Technology
Department of Manufacturing and
Construction Technology
Indiana State University
6th and Cherry Streets
Terre Haute, IN 47809

Dear Brad:

Thank you for your recent telephone call concerning my participation on the accreditation team for Eastern Michigan University. I am greatly honored by your request, and look forward to the May/June accreditation visit with enthusiasm!

In fact, I would like to begin preparing for this task immediately for several reasons. First, because I want to be as knowledgeable as possible about the EMU curricula in order to be an effective team member. Second, because I am conducting a Carl Perkins study that involves a national assessment of "Technology Education Implementation" at the college and university level. And third, because I was recently appointed to a task force at Southeastern to study and make recommendations concerning a core curriculum for our new College of Arts and Sciences, of which the Department of Industrial Technology is a component. I view this as a golden opportunity to promote both NAIT and Industrial Technology. In fact, the President of our institution, Dr. G. Warren Smith, stated in our first meeting that he would like to see a curriculum that "addresses technology literacy because that is what will be needed for individuals to function in the 21st century." One of the committee members (an MSU alum) specifically referenced Eastern Michigan University as an example or role model that we should examine. Therefore, it would be most timely if I could begin reviewing Eastern's self-study, even if in draft form.

Again, I thank you for this great opportunity. I know that the competition for participating on accreditation teams is stiff, much less for the team visiting the home of our NAIT office. As always, I pledge my efforts and energy to furthering the growth and stature of our profession and professionalism of NAIT.

Sincerely yours,

Jim

James R. Owens, Head
Department of Industrial Technology

JRO:bjl

Southeastern Louisiana University
Department of Industrial Technology
P.O. Box 847, SLU
Hammond, LA 70402
504-549-2189

June 19, 1989

Dr. Emerson A. Wiens
Department of Industrial Technology
College of Applied Science and
Technology
Illinois State University
Normal, IL 61761

Dear Emerson:

Thank you for your time and assistance regarding our NCATE Folio and Rejoinder. I really enjoyed meeting you at the recent ITEA Conference in Dallas. In one of our discussions, I mentioned a research project that I would be involved with this summer.

Enclosed is a draft of the Technology Education Assessment that I am currently working on. Any suggestions or information that you have relating to this Carl Perkins Research Project would be greatly appreciated. I am specifically interested in the survey that I responded to that you and Dr. Fecik conducted in January.

Thank you again for your past and current assistance.

Sincerely,

James R. Owens, Head

JRO:bjl

Enclosure

Southeastern Louisiana University
Department of Industrial Technology
P.O. Box 847, SLU
Hammond, LA 70402
504-549-2189

June 19, 1989

Dr. William V. Wittich
Technology Education Department
School of Applied Arts and Sciences
California State University
Long Beach, CA 90840

Dear Dr. Wittich:

The purpose of this letter is to request your assistance. I attended your Special Interest Session at the recent ITEA Conference in Dallas. I believe that the topic of your presentation relates to my research.

Enclosed is a draft of a Technology Education Assessment that I am currently working on. Any suggestions or information that you have relating to this Carl Perkins Research Project would be greatly appreciated. I am specifically interested in Technological Literacy in General Education. I feel that your study would have a definite impact upon my research findings. I certainly will share the results of my survey with you as soon as all data are compiled and analyzed.

Thank you for your assistance.

Sincerely,

James R. Owens

James R. Owens, Head

JRO:bjl

Enclosure

Southeastern Louisiana University
Department of Industrial Technology
P. O. Box 847, SLU
Hammond, LA 70402
504-549-2189

June 19, 1989

Dr. Edgar I. Farmer, Coordinator
Industrial and Technical Education
College of Education and Psychology
North Carolina State University
Box 7801
Raleigh, NC 27695-7801

Dear Dr. Farmer:

The purpose of this letter is to request your assistance. Enclosed is a draft of a Technology Education Assessment that I am currently working on. Any suggestions or information that you have relating to this Carl Perkins Research Project would be greatly appreciated. I am specifically interested in your "Principles of Technology" survey that I responded to on July 27, 1988. I believe that the results of your study would have a definite impact upon my research findings. I certainly will share the results of my survey with you as soon as all data are compiled and analyzed.

Thank you for your assistance.

Sincerely,

James R Owens

James R. Owens, Head

JRO:bjl

Enclosure

Southeastern Louisiana University
Department of Industrial Technology
P.O. Box 847, S.L.U.
Hammond, LA 70402
504-549-2189

June 19, 1989

Dr. Gene Gloeckner
Department of Industrial Sciences
College of Applied Human Sciences
Colorado State University
Fort Collins, CO 80523

Dear Gene:

I enjoyed seeing you at the recent ITEA Conference in Dallas. In one of our discussions, I mentioned a research project that I would be involved with this summer.

Enclosed is a draft of the Technology Education Assessment that I am currently working on. Any suggestions or information that you have relating to this Carl Perkins Research Project would be greatly appreciated. I am specifically interested in your experience with "Principles of Technology" infusion at the university level. I certainly will share the results of this survey with you as soon as all data are compiled and analyzed.

Thank you for your assistance.

Sincerely,

Jim

James R. Owens, Head

JRO:bjl

Enclosure

P. S. Colorado, Fort Collins, and C.S.U. all have a special place in my heart; and I am glad that a nice person like yourself is there to enjoy everything.

Southeastern Louisiana University
Department of Industrial Technology
P.O. Box 847, SLU
Hammond, LA 70402
504-549-2189

June 19, 1989

Dr. Ronald E. Jones
Department of Industrial Technology
College of Arts and Sciences
University of North Texas
P. O. Box 13198
Denton, TX 76203-3198

Dear Dr. Jones:

The purpose of this letter is to request your assistance. I wanted to attend your Special Interest Session at the recent ITEA Conference in Dallas, but could not because of a time conflict. I believe that the topic of your presentation relates to my research.

Enclosed is a draft of a Technology Education Assessment that I am currently working on. Any suggestions or information that you have relating to this Carl Perkins Research Project would be greatly appreciated. I am specifically interested in your plan for incorporation of Principles of Technology. I believe that your study would have a definit impact upon my research findings. I certainly will share the results of my survey with you as soon as all research data are compiled and analyzed.

Thank you for your assistance

Sincerely

James R Owens

James R. Owens, Head

JRO:bjl

Enclosure

Southeastern Louisiana University
Department of Industrial Technology
P.O. Box 417, S.U.
Hammond, LA 70402
504-549-2189

June 21, 1989

Dr. James L. Barnes, Assistant Professor
and Graduate Coordinator for Technology Education
College of Technology
Eastern Michigan University
Ypsilanti, MI 48197

Dear Jim:

I am sorry that I missed you two weeks ago when I was at EMU on the NAIT Accreditation visit. I did ask Everett to give you my regards.

Thank you for the undergraduate catalog and the "Framework for Technology Transfer" paper that you sent in March. I have enclosed a draft of a Technology Education Assessment that I am working on. Any sugestions or information that you have regarding this research would be appreciated. I am interested in your I.T. 103 course entitled "Introduction to Modern Industry" as it relates to my survey.

After formal meetings and informal conversations with Provost Collins and Associates Bennion and Johnson, I was impressed with the administrative support and respect that the College of Technology has on the EMU campus. That is true testimony to the hard work and dedication of the Faculty, Department Heads Israel, Kuwik, and Rokusek, and, of course, Dean Rudisill.

Thank you again for your past and current assistance.

Sincerely,

Jim

James R. Owens, Head

JRO:bjl

P. S. Is it an employment prerequisite that department heads and faculty at EMU drive Honda Accords?